

Mars Science Laboratory: The Next Rover

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The Mars Science Laboratory rover represents firsts in many aspects for interplanetary exploration. To get the rover to the planet's surface, the rover is winched down from the thrusters, substituting wheels for the usual platform, legs (or air bags) and off-ramp. The mass savings have afforded a larger rover and accompanying instrument payload. The landed platform, which is the landed rover, will carry an analytical laboratory with two instruments of unprecedented capability, a Gas Chromatograph/Mass Spectrometer, which includes a Harriet cell Tunable Laser System, and X-Ray Diffractometer, an instrument type not flown since the Viking landers in 1976. In addition, the other instruments represent innovative improvements with significant increases in capability. Of particular note, an instrument new to planetary exploration, is ChemCam, a laser induced breakdown spectroscope for remote sensing of chemistry and micro-imaging. This enables elemental/chemical composition to be measured at a meters distant, greatly expanding the survey capability. The details of MSL's approaches and the implications for future missions will be discussed.